

Appl. No. 10/538,915
Amdt. dated May 9, 2007
Reply to Office action of Nov. 14, 2006

REMARKS

Claims 18-37 are presently in the application. Claim 18 has been amended.

Claims 18-37 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The rejection indicates a lack of clarity regarding the recitation of the outlet openings being formed upon impact.

Accordingly, claim 18 has been amended to recite that the outlet openings being formed prior to impact of the magnet armature. This should clarify the language of the claims. Reconsideration of this rejection is respectfully requested.

Claims 18-37 have been further rejected under 35 USC 102(b) as being anticipated by Takeda (U.S. 5,918,818). Reference is made to the Office action for the detailed discussion of this rejection.

Claim 18 has been amended to include recitation that outlet openings are formed prior to impact of the armature and that one end face of the magnetic armature includes an armature bounce reducing damping face of non-magnetic material.

Comments regarding the cited prior art are as follows:

US 5,944,053 is related to a solenoid valve for heating systems. The solenoid valve includes a housing having a core which is actually movable in the housing and is connected by a shaft to a valve member. The valve member includes two valve heads, spaced apart from one another, one of which contacts an abutment region formed in a base plate of the solenoid housing. The abutment region provides damping to reduce solenoid noise.

Appl. No. 10/538,915
Amdt. dated May 9, 2007
Reply to Office action of Nov. 14, 2006

Further, U.S. 6,848,669 B2 is related to an electromagnetic fluid controller. The fluid controller prevents the action force of magnetic attraction between both abutting faces of an armature and a stator, and eliminates the necessity of a junction of the armature and the valve needle. According to U.S. 6,848,669 B2, see drawing on the front page thereof and col. 5, lines 19-31, the entire area of the end face of the stator 40 is coated with a non-magnetic material film 41. The thickness TF of the non-magnetic material film 41 has no effect on the dimension setting of the lift amount DL generated by both the abutting faces of the armature 31 and the nonmagnetic material film 41 formed on the end face of the stator 40.

U.S. 6,764,061 B2 is related to a solenoid valve for controlling an injection valve of an internal combustion engine. Concerning this reference, said solenoid valve includes a housing part, an electromagnet having a magnetic coil and a magnetic core, an armature acted upon by a valve spring and axially moveable between the electromagnet and a valve seat. Still further, a control valve member is moved by the armature and cooperates with the valve seat for opening and closing a fuel passage. The armature is situated in the housing part moveable in the radial direction free from mechanical guiding means. A further embodiment of U.S. 6,764,061 B2 provides that, when a current is applied to the electromagnet, the armature may be aligned in the radial direction, by magnetic reluctance forces then acting upon the armature, into a centrical position with reference to the centreline of the electromagnet.

According to our understanding of the reference, the plain face of armature 31 as well as the plain face of the stator 40 are provided with no damping material whatsoever.

The Takeda reference (U.S. 5,918,818), is related to an electromagnetically actuated

Appl. No. 10/538,915
Amdt. dated May 9, 2007
Reply to Office action of Nov. 14, 2006

injection valve. This valve includes a non-magnetic stopper between the yoke and the fixed core, a valve for opening and closing the injection hole, a moveable core, the axial movement of which is limited by the stopper. Still further, an electromagnetic coil for attracting, when energized, the moveable core is provided. The moveable core contacts the stopper and an air gap is formed between a surface of the moveable core and at least one of the yoke and the fixed core.

None of the prior art, and in particular Takeda, discloses or suggests the invention as recited in the claims. In particular, none of the prior art discloses or suggests outlet openings being formed prior to impact of the magnetic armature and an armature bounce reducing damping face of non-magnetic material.

In the instant invention outlet openings 18, 35, are being formed prior to the impact of the magnetic armature. The invention works prior to armature impact as best shown in Figure 5. As explained in the specification, the damping face 20 defines a hydraulic damping chamber.

There is no mention in Takeda of creation of a hydraulic damping face that reduces bounce. In Takeda, the face is merely a stopper. There is no teaching or suggestion of bounce reducing in the reference.

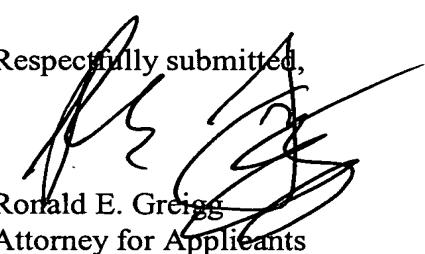
All claims depend from claim 18 and are allowable for at least the reasons applicable to claim 18.

Appl. No. 10/538,915
Amdt. dated May 9, 2007
Reply to Office action of Nov. 14, 2006

The Commissioner is hereby authorized to charge the fees associated with the three months extension of time to Deposit Account 07-2100.

Entry of the amendments and allowance of the claims is respectfully requested.

Respectfully submitted,


Ronald E. Greigg
Attorney for Applicants
Registration No. 31,517
CUSTOMER NO. 02119

GREIGG & GREIGG, P.L.L.C.
1423 Powhatan Street, Suite One
Alexandria, VA 22314
Tel. (703) 838-5500
Fax. (703) 838-5554

REG/MLG/hhl

J:\Bosch\R303599-1\Reply to 11-14-06 OA.wpd